

REMARKS

Claims 1-29 are pending after entry of this paper. Claims 1-29 have been rejected. Applicants reserve the right to pursue withdrawn and cancelled claims in a divisional or continuing application.

Claims 1-29 have been amended. Support may be found throughout the instant specification. No new matter has been introduced by these amendments. Reconsideration and withdrawal of the pending rejections in view of the above claim amendments and below remarks are respectfully requested.

Response to Rejections under 35 U.S.C. §103

Claims 1-29 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,607,104 to Blickle et al (“Blickle”) in view of U.S. Patent No. 6,083,400 to Nyman et al (“Nyman”). Examiner argues that “it would have been obvious to have applied the apparatus and process of Blickle to the treatment of dispersions containing organic and aqueous phases, as suggested by Nyman, in order to even out the flow volumes of the phases, reducing turbulence, and effecting an even, continuous mass flow.” (Office Action pg. 4). Applicants respectfully disagree and submit that claims 1-29 are patentably distinct from the cited art for the following reasons.

Examiner argues that “Blickle discloses a method and apparatus for separating of components of liquid or aqueous phase mixtures that may be obtained from metal or mining recovery operations concerning copper ore”, but concedes that Blickle does not teach separation of dispersions. (Office Action pg. 3-4). Examiner applies Nyman to remedy this deficiency,

contending that Nyman teaches the use of a “horizontal flow chamber to treat dispersions of organic and aqueous phases employed in the extraction of copper ore.” (Office Action pg. 4).

First, addressing the method of the present invention, as Examiner is well aware, “a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983). Furthermore, “a prior art reference that teaches away from the claimed invention is a significant factor to be considered in determining obviousness.” *MPEP* § 2145. And, “it is improper to combine references where the references teach away from their combination.” *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)

In the first instance, Blickle clearly teaches away from the use of dispersions in metal extraction. Specifically, Blickle states that “the invention is based on the recognition that if in a chamber divided in two by a partition wall having fine perforations two different media are caused to flow, a very fast mass transfer takes place between the two media without the two media being mixed through the perforations of the partition wall.” (Blickle, col. 1, lines 29-32) (*emphasis added*). Furthermore, Blickle teaches that the size of the perforations is important to prevent transfer of materials between chambers. (see Blickle at col. 3, lines 27-33). However, Nyman teaches “a method for recirculating the heavier solution in liquid-liquid extraction in between the solution separation part and mixing unit in a process where two unmixed solutions are first mixed and then the solutions are separated.” (Nyman at col. 1, lines 8-13) (*emphasis added*). Therefore, Blickle and Nyman teach incompatible methods; the former being the maintaining of the separation of different media, and the latter being the intentional mixing then separation of aqueous and organic solutions.

Furthermore, applicants disagree with Examiner's contentions that Blickle teaches a method with a reversing step as recited in claim 1. Specifically, Examiner contends that Blickle teaches a method where the upper and lower perforated plates situated horizontally and perpendicular to the partition wall in combination with the baffle plates may function as a reversing element. (see Office Action pg. 4). First, Blickle does not teach reversing of the flow of the media in the compartments. Specifically, Blickle makes clear that the perforated partition is to divide the apparatus into chambers and prevent mixing (Blickle at col. 3, lines 27-32):

[t]he actual size of the perforations is dependent on the materials to be handled, in [the] case of solids taking part in the process the size will be generally determined so that solid grains should not move from one chamber into the other, or should only do so below a predetermined grain size. In [the] case of foams the size of perforation is generally chosen to be smaller in order that the foam-forming gas should not pass through the wall.

Furthermore, the baffle plates are to control flow and increase turbulence and the "the perforations of this [bottom] plate serve only for the distribution of gas or fluid in their inlet or outlet flow, and not for effecting the operation, hence any perforated plate used for such purposes can be equally well used in the equipment." (Blickle at col. 3, lines 16, and 40-44) (*emphasis added*). Second, even taking the broadest interpretation of "reversing," for example assuming counter-flow of the media in the compartments and mass transfer from one to the other, Blickle still does not teach a method of reversing a dispersion and separated aqueous and organic solution phases by means of a reversing element as recited in claim 1.

The method of Nyman does not cure Blickle's deficiencies. Examiner contends that the "Nyman process and apparatus also employs a return flow of dispersion phases and employs vertically and horizontally oriented partition and baffle walls and flow reversing

structure.” (Office Action pg. 4). Applicants respectfully disagree. Nyman’s method employs the use of a picket fence, which does not function as a reversing element as recited in claim 1. (see Nyman at col. 2, line 54). As seen in Figure 1, the picket fence employed in Nyman extends the full width of the settler and does not divide the apparatus into multiple chambers. Also Nyman does not disclose any reversing properties of the picket fence, but instead teaches the picket fence forms a restricted transversal surface in the separation. (Nyman at claim 1, col. 5, lines 64-66). Furthermore, the collecting channel, the function of which is to recirculate, not reverse, the aqueous solution into the settler, alters the flow of only the aqueous solution to be transversal to the flow of the settler not vertical. (see Nyman at col. 2, lines 20-23; col. 3, lines 31-35). In contrast the present invention employs a method of damming up the dispersion remaining in the middle of the separated phases by means of at least one reversing element placed in the rear part of the outward flow field extending from the sidewall of the separation section to the partition wall; turning the direction of the dispersion substantially to a vertical flow; and reversing by means of a reversing element the direction of the dispersion and separated solution phases in the rear space of the separation section in substantially the opposite direction. Therefore, it would not have been obvious to one of ordinary skill in the art to combine the teachings of Bickler and Nyman to arrive at the method of the present invention.

Claim 10 recites equipment comprising a settler for the controlled separation of a dispersion of aqueous solution and organic solution formed in a mixing section into their own phases during metal recovery in a liquid-liquid extraction settler comprising...a solid partition wall dividing the settler into two sections...an outward flow field and a return flow field, and further comprising a reversing element which extends from one of the sidewalls to the end of the partition wall located crosswise in relation to the longitudinal axis of the settler and said

reversing element comprising of at least two reverser plates situated at different heights. One of ordinary skill in the art would not have been motivated to combine the apparatuses as taught in Blickle and Nyman to arrive at the apparatus as taught in the present invention.

First, the equipment in Blickle is not a settler, but an at least two-chamber apparatus where the chambers are separated by a perforated partition allowing for a specified mass transfer between the chambers, but not mixing of the media in the chambers. (see Blickle at col. 3, lines 27-33). While Nyman employs a settler apparatus, it is a one-chamber settler, without a partition wall, where a dispersion phase is separated into an aqueous solution phase and an organic solution phase in one separation part. (see Nyman Figure 1).

Second, neither of the apparatuses in Blickle and Nyman, alone or in combination, employs an outward flow field and return flow field where both the dispersion and the separated aqueous and organic solutions phases flow. While Blickle employs an at least two-chamber apparatus, there is no dispersion and thus no separation into an aqueous and organic solution. Also the media in each chamber flows in and out through inlets attached to their respective chambers. (see Blickle Figures 1-4). In the one-chamber apparatus of Nyman, the dispersion enters in the front end of the settler and travels towards the rear end of the settler where the separated aqueous and organic solutions are discharged. (see Nyman Figure 1). Also the recirculating pipes of Nyman only recirculate the aqueous solution phase back into settler through the mixer units.

Third, neither Blickle nor Nyman, alone or in combination, teach an apparatus with a reversing element. As stated above, Blickle does not disclose an apparatus where the upper and lower perforated plates situated horizontally and perpendicular to the partition wall in combination with the baffle plates may function as a reversing element. (see Office Action pg.

4). Again, Blickle does not employ a reversing element nor is there reversing of flow within the compartments. Specifically, Blickle makes clear that the purpose of the perforated partition is to divide the apparatus into chambers and allow for specific mass transfer without mixing; the baffle plates are to control flow and increase turbulence, but do not reverse the flow of the media in their respective chambers; and the perforated bottom plate simply allows for the distribution of gas or fluid in their inlet or outlet flow, and not for effecting the operation. (see Blickle at col. 3, lines 16, 27-32, and 40-44) (*emphasis added*). There is nothing to suggest that these elements of the Blickle apparatus are the reversing element as recited in claim 10. The collecting channel of Nyman is “mainly formed of a tubular element placed inside the aqueous solution layer and provided with suction pipes that are directed downwards in an inclined fashion and are open at both ends.” (Nyman at col. 3, lines 1-4). These suction pipes smoothly suck only the aqueous solution, not disturbing the proceeding of the extraction solutions in the separation part, into the collecting channels where the flow is then transversal to the settler flow. (Nyman at col. 1 lines 16-18; col. 3, lines 19-21 and 31-35). In contrast in the equipment of the present invention:

[t]he reversing element for its part comprises at least two plate-like parts or reverser plates, placed at different heights and substantially perpendicular to the longitudinal axis of the settler (in the direction of flow of the solutions) [where] [t]he direction of flow of the dispersion in the area formed between the reverser plates, in the reversing channel, is almost vertical, because the dispersion is made to flow above or below each reverser plate into the reversing channel

and the flow of the dispersion is dammed up in the outward flow field. (Instant Application at pg. 5, lines 15-21)

Therefore, for the above stated reasons, Blickle and Nyman do not disclose each and every element of the instant apparatus claims. Thus, the instant invention is not obvious in

view of Blickle and Nyman and applicants respectfully request reconsideration and withdrawal of this §103(a) rejection to claims 1-29.

Response to Provisional Non-Statutory Double Patenting Rejection

Claims 1-29 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-38 of copending Application No. 10/549,396. Since the conflicting claims have not in fact been patented, this is a provisional obviousness-type double patenting rejection.

In response, applicants respectfully request that the provisional double-patenting rejection be held in abeyance due to the provisional nature of the rejection until one of the applications is allowed. Upon notice of otherwise allowable subject matter, applicants will address the rejection. Applicants note that it is proper when dealing with otherwise allowable subject matter in co-pending applications to withdraw a provisional rejection in the most advanced application, allow it to issue, and make a (non-provisional) rejection in the remaining application.

Dependent Claims

The applicants have not independently addressed all of the rejections of the dependent claims. The applicants submit that for at least similar reasons as to why independent claims 1 and 10 from which all of the dependent claims 2-9 and 11-29 depend are believed allowable as discussed *supra*, the dependent claims are also allowable. The applicants however, reserve the right to address any individual rejections of the dependent claims and present

independent bases for allowance for the dependent claims should such be necessary or appropriate.

Thus, applicants respectfully submit that the invention as recited in the claims as presented herein is allowable over the art of record, and respectfully request that the respective rejections be withdrawn.

CONCLUSION

Based on the foregoing amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims and allowance of this application. Favorable action by Examiner is earnestly solicited.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 4819-4753.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 4819-4753.

Respectfully submitted,
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